



WEB2.0 TECHNOLOGY FOR 21ST CENTURY SKILLS: UNDERSTANDING AND COMPARING SCIENCE STUDENTS' PERCEPTION

Prerana Gautam¹ | Ahrar Husain²

¹ Research Scholar, IASE, JMI, New Delhi.

² Professor, IASE, JMI, New Delhi.

ABSTRACT

The internet advanced technology has reshaped the process of data sharing and communication. Web2.0, a computer mediated technology fostered the interaction, communication and information sharing. The Technology has taken the special place, in education particular that helps educators and learners to be in contact and supports knowledge transformation. The 21st century learners are academically and technically sound thus the application of Web2.0 into education helps in developing the Higher Order Thinking Skills i.e 21st century skills.

This research paper is an attempt to study and compare the usage pattern of Web2.0 technology by the science students of Higher education. The perception of the students in relation to the use of Web2.0 technology for subject specific skill is also compared on the 5 point likert scale. The students are taken from the different streams. N=160 is the sample size. Analysis is carried out by using t-test from SPSS software.

KEYWORDS: Subject Specific Skill, 21st century learners, Web2.0 technology, Higher Order Thinking skill.

INTRODUCTION:

The integration of Web2.0 technologies into the education is an avalanche in sharing and collaboration of information among group of people. The advent of internet mediated technology has revolutionised the dynamics of communication for all purposes. Web2.0 technology is a platform where content users are now the content creator by contributing, collaborating and sharing. There are numerous educational opportunities and out-of-classroom teaching methods that a teacher can explore to keep the learner to indulge in collaborative learning. The term Web2.0 has started in the year 2004 by Tim O' Reilly at Media live International Conference with special feature that allowed individuals to communicate in a unique way (O' Reilly, 2005). Web2.0 is a broad term includes new interactive technologies and web based applications; most of them are being used in education (Salehe, 2008). Generally Web2.0 identified as "Social Software" with tools as Wikis, SNS, Educational blogging, Pod casting, Media sharing technologies, Social bookmarking, RSS feeds and Instant messaging that enables the users to create and disseminate the content (Zhang Leilei & Jinmin, 2012). For that reason traditional classroom settings are being converted into the digitized technology rooms (Weyant & Gardner, 2010).

SNS, one of the most common tools of Web2.0 technology is common phenomenon among the learners to interact with each other. The interactive features of Web2.0 technology i.e. profile surfing, posting messages, photos and videos are the way to keep updates on recent activities (Singh & Gill, 2011).

Keeping in the view this paper will study the usage pattern of the Web2.0 technology among the students of science of higher education. Their perception about Web2.0 technology in developing different skills is also studied. In the context of the paper, the subject specific skills are related to the "Higher Order Thinking Skills" such as IT literacy skill, communication skill, Language Learning skill, Reasoning ability skill, Analytical skill etc.

RESEARCH OBJECTIVES:

Following research objectives are set up:

- 1) To study the usage pattern of Web2.0 technology among the students of science of higher education.
- 2) To study the perception of students in relation to the use of Web2.0 technology for the subject specific skill.

RESEARCH DESIGN:

The sample size is 160 from five different universities and four different disciplines i.e Engineering Group (Mechanical, ECE and Electrical), Science Group

(Physics, Chemistry and Maths), Science Group (Bio Sc, Biotech and Physiotherapy) and Education (Physical sc, Life sc, Home sc). The Stratified random sampling is used to select the sample. From each discipline 40 students are taken. The five universities are Jamia Millia Islamia, Lingayas University, Manav Rachna University, Amity University and Apeejay University.

The Means are calculated and t-test from the SPSS software is applied.

SAMPLING TECHNIQUE:

The stratified random sampling is used to select the sample:
160 = (40+40+40+40)

Table 1: Sampling Technique

Sample Size	Engineering Group		Science Group (PCM)		Science Group (Biosc, Biotech, Physio)		Education Group	
160	40		40		40		40	
Division of students on their course of study	Ph.D.	M.tech	Ph.D.	M.tech	Ph.D.	MS	Ph.D.	M.Phil
	20	20	20	20	20	20	20	20

METHODOLOGY:

The four science groups are taken i.e Engineering, SC(PCM), SC (Biosc, Biotech, Physio), Education. Each group is compared with Education group and data is analysed. To compare t-test is applied through SPSS software version 21.

DATA ANALYSIS AND INTERPRETATION:

- 1) **Analysis of Objective 1:** To study the usage pattern of Web2.0 technology among the students of science of higher education.

In order to study the usage pattern of Web2.0 tools, a self prepared questionnaire as a tool is used. This tool comprised of 7 different dimensions such as "commonly used tools, Level of easiness, Rank the tool according to the suitability, Frequent access of tools, The benefits of using the tools in education, Rank the tool according to the suitability, The use of Web2.0 tools for different educational purposes etc. Total items in the questionnaire are 59 and analysed on 3-6 anchor point scale. The Means are calculated and the t-test is applied to compare the groups.

Table2: Usage Pattern of WEB2.0 technology among the students of Science: T test Analysis

Table2: Usage Pattern of WEB2.0 technology among the students of Science: T test Analysis									
		Paired Differences				T	Df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	FEngg - FEducation	.56831	.39016	.05079	.46663	.66998	11.188	58	.000
Pair 2	FScPCM - FEducation	.44644	.42959	.05593	.33449	.55839	7.983	58	.000
Pair 3	FScbioscBiotechPhysio – Feducation	.32458	.28107	.03659	.25133	.39782	8.870	58	.000

Interpretation 1:**Faculty of Engineering Vs Faculty of Education:**

The mean value is calculated as .56831 at 58 df and the t value is 11.188. (t cal < 0.05). The significant value at 2 tailed tests is 0.000 is less than the 0.05 level of significance. Thus there exists a significant difference about the usage pattern of Web2.0 technology among the students of both the faculty.

Faculty of Sc(PCM) Vs Faculty of Education:

The mean value is .44644 and the t value is 7.983 at 58 df. The significant value at 2 tailed tests is 0.00 which is less than the 0.005 level of significance and there exists a significant difference among the students of both the faculty about the usage pattern of Web2.0 technology.

Faculty of Sc(Biosc, Biotech, Physio) Vs Faculty of Education:

The mean value is .32458 and the t value is 8.870 at 58 df. The significant value for 2 tailed tests is .000 which is less than the 0.005 level of significance. That reflects there exists a significant difference among the students of both the group about the usage pattern of Web2.0 technology.

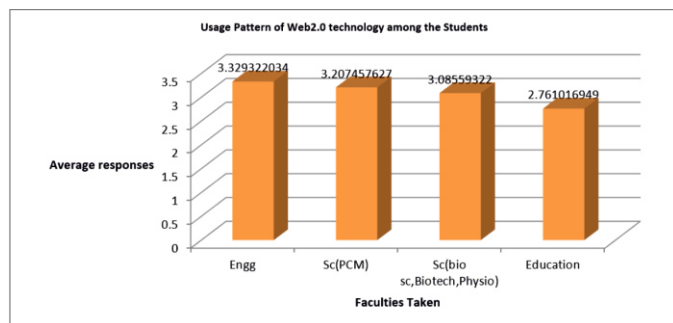


Fig1: Comparison of Means of each group

Findings and Result of Objective 1:

The study signifies that, the students of Engineering group are using the technology more for different educational purposes. 85% of the Engineering students, 80% of the Sc (PCM) students are using the Media sharing sites (You tube). 37% of the Engineering students, 28% of the students from the Sc (PCM) group, 20% of the Sc(Biosc, Biotech, Physio) students and 13% of the students from Education Group are using the Slideshare. Also, Email is the best common and frequent used tool for interacting with the peer groups and the mentors. The educational groups created on the SNS (specifically face book) are also one of the sources to have the different educational updates about workshops and conferences. The students from Engineering and Science (Phy, Chem, Maths) use the technology for downloading the various lab experiments and expert lectures. The students from the Education group use the You tube to download the tutorials and learning materials for their research work. 32.5% of the Engineering students, 20% of the Sc (PCM), 17.5% of the students from the Sc (Biosc, Bio tech, Physio) and Education group are using the blogs to share the data. 100% of the students are using the technology to search the content online. 87% of the Engineering students, 82% of the Sc (PCM) students, 70% of the Sc(Biosc, Biotech, Physiotherapy) and 67% of the Education students are using the technology to watch the online and recorded lectures. It was seen that the students are using the technology to receive the information as one end user only.

2) Analysis of Objective 2: To study the perception of students in relation to the use of Web2.0 technology for subject specific skill.

A Likert scale of 25 statements related higher order technical skills are taken in the tool. The following tables represent the comparison:

Table 3: The perception of students about WEB2.0 Vs Subject Specific Skill: T test Analysis

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Engg – Education	.37880	.37190	.07438	.22529	.53231	5.093	24	.000
Pair 2	ScCM – Education	.35120	.45465	.09093	.16353	.53887	3.862	24	.001
Pair 3	SCBiosc Physio – Education	.14920	.36092	.07218	.00022	.29818	2.067	24	.050

Interpretation 2:**Faculty of Engineering Vs Faculty of Education:**

The Mean value is 0.37880 and t value at 5.093 at 24 df. The significant value at 2-tailed test is 0.000 < 0.05 level of significance. Thus there exists a significant difference among the students of both the group about the perception of using the Web2.0 technology for subject specific skill.

Faculty of Sc (PCM) Vs Faculty of Education:

The Mean value is 0.35120 and t value at 3.862 at 24 df. The significant value at 2 tailed tests is 0.001 < 0.005 level of significance. Thus there exists a significant difference among the students of both the group about the perception of using the Web2.0 technology for subject specific skill.

Faculty of Sc (Biosc, Biotech, Physio) Vs Faculty of Education:

The Mean value is 0.14920 and t value at 2.067 at 24 df. The significant value is 0.05 which is equals to 0.05 level of significance. Thus the students from both the group were found to have difference in perception of using the Web2.0 technology for subject specific skill.

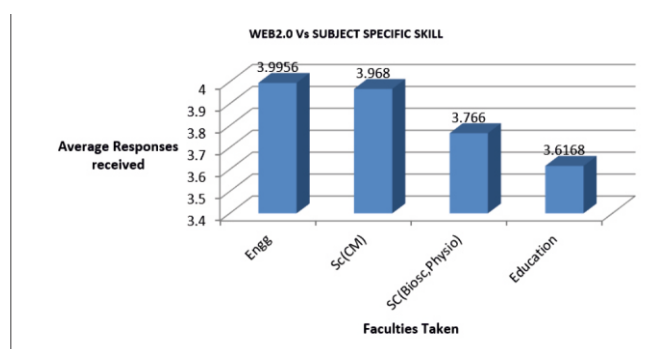


Fig2: The perception of students about Web2.0 Vs Subject specific skill: A Comparison

Findings and Result of Objective 2:

The Web2.0 technology is more communicative and interactive in nature. The responses received by the users are quick and authentic. The students from the Engineering groups were found to develop their higher order thinking skill along with the technological skill. Web2.0 supports the IT literacy skill. Web2.0 technology is synchronous mode of communication, thus by receiving the feedback student feel more curious. More than 90% of the students from each group are agreed that accessing the Web2.0 technology develops the IT skills among them. 85% of the Engineering students, 62% of the Sc(PCM) students, 60% of the Sc(Biosc, Biotech, Physio) and 64% of the Education students are agreed writing text, writing blogs and accessing the online learning material develops the Writing and language learning skills. 93% of the Engineering students, 67% of the Sc(PCM) students, 56% of the Sc(Biosc, Biotech, physio) students and 50% of the students are agreed that Web2.0 technology develops reasoning ability skill as the students have to write the content of the assignment in a constructive way. Students are also agreed that when listening to the lectures or the tutorials from the You tube develops the observation and hence the understanding skill. 100% of the Engineering students, 82.5% of the Sc(PCM), 72% of the Sc(Biosc, Biotech and physiotherapy) students and 67% of the students from the Education group are agreed that technology keeps the learner in active internet search and hence develops content searching skill.

Implications and Conclusion:

The study specifies that there exists difference among the learners of different disciplines taken in using the technology. Emails, Youtube, SNS (facebook), Slideshare.com are few of the tools which were common among the learners. Though there was awareness about the technology but only few were using it by own. Web2.0 technologies provide ways to explore different medium of learning. 21st century learners are digitally driven and require an interactive and collaborative learning environment for which Web2.0 enabled education is the best suited for. Among the four groups, the students from Engineering were found to use the technology commonly and more frequently. Being from a technical background, the students are much busy in searching the content online, as every time they have a new case which involve more R&D work. As a technical savvy, the research work is more formula driven hence needs more interaction with real world scientists.

Youtube was recommended as one of the common tool to download the experiments where as Skype was used to meet the experts on the same platform. The students from the four groups were agreed that using the technology sharpen the 21st century skills if the technology would integrate into the pedagogy. The respondents were agreed that 21st century skills will be supported in a way that learners, communication skills will be enhanced; involvement and engagement will be fostered with Web2.0 technologies. Most of the students were agreed that writing blogs, writing wikis improves language learning skill and peer coaching skill as specific content is transmitted between students. Web2.0 technologies if used in science education would support the open science approach. Variety of tools

allows users to have more opportunities of content creation and self publication as large number of audience can know them. With the latest technology, students can know the world and let the world should know them. Using Web2.0 technologies not only fosters the 21st century skills but also boosts authentic environment for teaching and learning process.

REFERENCES:

1. Andreson, A., 2007, "What is Web2.0? Ideas, technologies and implications for education. Bristol, JISC Technology and Standards watch.
2. Berners . Lee T. & Lawson M. "Berners-Lee on the read/write web." BBC News .Accessed August 1, 2008 from <http://news.bbc.co.uk/1/hi/technology/4132752>.
3. Collis , B., & Moonen , J., 2008. "Web2.0 Tools and Processes in Higher Education: Quality Perspectives". Educational Media International, 45,2; 93-106.
4. Ganaie, A., S., 2012, "Use of Web2.o Technology by Faculty Members of National Institute of technology (NIT), Srinagar: International journal of Engineering Research and Applications, 2248-9622, vol.2, issue 6,pp. 690-696.
5. Gupta, S., & Seth, A (2014). "Web2.0 tools in Higher Education ", Trends in Information Management, 0973-4163, vol 10(1), pp. 1-11.
6. Hamid, S., Chang, S. & Kurnia, S (2009). Identifying the use of online social networking in higher education. In Same places, different spaces. Proceedings ascilite Auckland 2009. <http://www.ascilite.org.au/conferences/auckland09/procs/hamid-poster.pdf>.
7. Hazari, S., North, A., & Mreland, D., 2009, "Investigating the value of Wiki technology. Journal of Information Systems Education, 20, 187-198.
8. Luo, L.: Web2.0 integration in Information Literacy Instruction: An Overview, J. Acad. Libr., 36, 32-40.
9. O'Reilly, Tim. 2005. "What is Web2.0: Design patterns and Business Models for Next generation of Software." <http://www.elisa.net.fi/aariset/multimedia/web2.0/what%20is%202.doc>.
10. Salehe, Bajuna R. 2008, "Elimu 2.0: investigating the Use of Web2.0 for Facilitating Collaboration in HE." <http://arrow.dit.ie/scschcom/dis/8>.
11. Sibbet, D., 1997, 75 years of management ideas and practice: 1922-1997. Havard Business Review, 75, 2-12.
12. Siemens, G., & Weller, M., 2011, "Higher education and the promise and the perils of social network. Revista de University y Sociedad del conocimiento(RUSC), 8(1), 164-170.
13. Singh, KP ., & Gill, M., 2011, "Use of social Networking Sites by the Research Scholars: A study of Guru Nanak Dev University, Amritsar." Library Herald, vol49, issue 3.
14. Waycott, J., & Kennedy, G., 2009, "Mobile and Web2.0 technologies in undergraduate science: situating learning in everyday experience" in Same Places and Different Spaces. Proceedings of the Australian Society for Computers in Learning in Tertiary Education 2009, eds. R. Atkinson and C. McBeath, Ascilite, Auckland, pp. 1085-1095.
15. Weyant, L.E., & Gardner, C. L., 2010. Web 2.0 application usages: Implications for management education. Journal of Business, Society & Government, 2, 67-78.